

United States Department of the Interior, Bureau of Reclamation, 1987, **Design of Small Dams**, Third Edition.

APPENDIX A

Amended Ordinance Section 30-7 - Randleman Lake Watershed Regulations (effective January 1, 2000)

Map of the Greensboro Water Supply Watershed

Map of the Greensboro Water Supply Watershed Critical Area

I

AMENDING CHAPTER 30

AN ORDINANCE AMENDING THE GREENSBORO CODE OF ORDINANCES
WITH RESPECT TO ZONING, PLANNING AND DEVELOPMENT

Section 1. That Section 30-1 –3.12(E) is hereby amended to read as follows:

- (E) Provide for natural and engineered methods for managing the ~~storm water~~ stormwater which flushes contaminants off of built-upon areas in the water supply watersheds and which may reach water supply reservoirs unless controlled.

Section 2. That Section 30-2-1, Definition Index, is hereby amended by adding into alphabetical sequence the defined words and ordinance references as shown below:

Intermittent Streams 30-2-2.2
Riparian Protection Area 30-2-2.2

and that Section 30-2-2.2, Drainage and watershed protection, is hereby amended by changing and adding definitions as shown below:

Discharging landfill. A facility with liners, monitoring equipment, and other measures to detect and/or prevent leachate from entering the environment and in which the leachate is treated on site and discharged to a receiving stream. These facilities require approval and a discharge permit from the NC Department of Environment, ~~Health~~ and Natural Resources for legal operation.

EMC Rules. Statewide water supply watershed protection rules, and special rules for certain water supply watersheds, adopted by the NC Environmental Management Commission and enforced by the Division of Water Quality of the Department of Environment, ~~Health~~ and Natural Resources to carry out the requirements of the NC General Statutes addressing water quality. NC Administrative Code Section: 15A NCAC 2B .0100 and .0200.

Intermittent streams. Streams, and lakes and ponds along them, that are indicated as being intermittent 1) on the most recent version of the US Geological Survey 1:24000 scale (7.5 minute quadrangle) topographic maps, 2) on the most recent version of the Soil Survey map developed by the USDA - Natural Resource Conservation Service, or 3) by an examination of site-specific evidence by the City Stonn Water Services Division using criteria approved by the NC Division of Water Quality. However, if the above-mentioned map indicates an area as an intermittent

Approved as to for:
-City Attorney

AMENDING CHAPTER 30

15.

AN ORDINANCE AMENDING THE GREENSBORO CODE OF ORDINANCES
WITH RESPECT TO ZONING, PLANNING AND DEVELOPMENT

Section 1. That Section 30-2-2.7, General, is hereby amended by changing the definition of "Group Care Facility" to read as follows:

"GROUP CARE FACILITY. A facility licensed by the State of North Carolina, (by whatever name it is called, other than "Family Care Home" as defined by this Ordinance), with support and supervisory personnel that provides room and board, personal care, or habilitation services in a family environment for not more than thirty (30) people in a residential or office district and for not more than forty (40) people in any other district."

Section 2. That Section 30-5-2.46, Group Care Facilities, is hereby amended to read as follows:

"30-5-2.46 Group Care Facilities

Where Required: GO-M, GO-H, CB, and PI Districts.

Property Separation: No such facility shall be located within one-quarter (1/4) mile of an existing group care facility or a shelter for the homeless.

Operation: The facility shall be limited to not more than thirty (30) persons in a GO-M or GO-H District and not more than forty (40) persons in a CB or PI District."

Section 3. All ordinances in conflict with the provisions of this ordinance are repealed to the extent of such conflict.

The foregoing ordinance was adopted by the
City Council of the City of Greensboro on the
21 day of December, 1999, and with
full and effective immediately upon its

Juanita F. Cooper
City Clerk

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stream but the Storm Water Services Division finds no intermittent water body actually exists on the ground, that area shall not be deemed an intermittent stream. Ponds and lakes created for animal watering, crop irrigation, or other agricultural uses that are not part of a natural drainageway are not streams. If the City of Greensboro develops a detailed stream network map covering one or more watersheds, and that map is approved by the NC Division of Water Quality, then within the watersheds covered by that map intermittent streams shall thenceforth be as shown by that map.

Perennial streams. In water supply watersheds other than the Upper and Lower Randleman Lake watersheds, sStreams shown on the Guilford County Designated Water Supply Watershed Map, dated June 30, 1991 (see definition below). In the Upper and Lower Randleman Lake watersheds, streams, and lakes and ponds along them, that are indicated as being perennial 1) on the most recent version of the US Geological Survey 1:24000 scale (7.5 minute quadrangle) topographic maps, 2) on the most recent version of the Soil Survey map developed by the USDA -Natural Resource Conservation Service, or 3) by an examination of site-specific evidence by the City Storm Water Services Division using criteria approved by the NC Division of Water Quality. However, if the above-mentioned map indicates an area as a perennial stream but the Storm Water Services Division finds no perennial water body actually exists on the ground, that area shall not be deemed a perennial stream. Ponds and lakes created for animal watering, crop irrigation, or other agricultural uses that are not part of a natural drainageway are not streams. If the City of Greensboro develops a detailed stream network map covering one or more watersheds, and that map is approved by the NC Division of Water Quality, then within the watersheds covered by that map perennial streams shall thenceforth be as shown by that map.

Pond and/or stream buffer plat. A plat recorded to show one or more engineered stormwater runoff controls structures, water quality conservation easements, stream buffers or other features created pursuant to watershed protection requirements and to put present and future owners on notice of maintenance requirements. A subdivision plat with appropriate information may be used to fulfill the pond and/or stream buffer plat function.

Riparian protection area. A stream buffer, or a portion of a stream buffer, subject to stronger maintenance and protection requirements than are applied to other stream buffers. It consists of Randleman Zone I and Randleman Zone 2, as described in Section 30-7-1.8 (Stream buffer required).

Stream buffer. A natural or vegetated area through which stormwater ~~storm-water~~ runoff flows in a diffuse nianner so that the runoff does not become channelized and which provides for infiltration of the runoff and filtering of pollutants. The buffer width is measured landward from the normal pool elevation of impoundments and from the top of bank ~~on~~ of each side of streams or rivers. (This definition applies only with respect to watershed protection regulations.)

Substantially completed. Work has progressed to the point that, in the opinion of the Enforcement Officer, it is sufficiently completed in accordance with the approved plans and specifications that the work can be utilized for its intended purposes. For ponds ~~permanent runoff control structures~~ this generally means that the following have been accomplished; 1) the dam has been constructed to the approved lines and grades; 2) all slopes have been fine graded, seeded, mulched, fertilized, and tacked to establish permanent ground cover; 3) principal and emergency spillways have been installed at the approved elevations and dimensions; and 4) permanent velocity controls on the inlet and outlet pipes and channels have been installed.

Watershed, water supply. The entire area contributing drainage to Lake Townsend, Lake Brandt, Lake Higgins, Oak Hollow Lake, High Point City Lake, Lake Mackintosh, Polecat Creek Lake, ~~Reidsville Reservoir~~, and the proposed Randleman Lake Reservoir.

Watershed manual. This shall mean the Guilford County Water Quality Protection Manual, dated March, 1990, as amended, until such time as the City of Greensboro Stormwater ~~Storm-Water~~ Best Management Practices ~~Guidance~~ Manual is adopted; thereafter it shall mean the Greensboro manual.

Watershed map. The map incorporated by reference at Section 30-7-1.2 (Incorporation of Designated Water Supply Watershed Basin Map(s)).

Wet detention pond. An engineered stormwater ~~storm-water~~ control pond that has a permanent pool and also controls runoff from the first one inch (1") of rainfall, removes eighty-five ~~85~~ percent (85%) of total suspended solids (TSS), and releases the stormwater ~~storm-water~~ over a period of two to five days.

Section 3. That Section 30-3-11.6 is hereby amended to read as follows:

30-3-11.6 Permanent ~~run-off~~ engineered stormwater controls ~~structures~~ and soil erosion and sedimentation control devices installation

Any approved permanent ~~run-off~~ engineered stormwater controls ~~structures~~ and soil erosion and sedimentation control device(s) may be installed prior to approval of street and utility construction plans.

Section 4. That Section 30-4-6.1 (B), Single Family Detached Cluster Development, is hereby amended by adding a new Subsection (5) to read as follows:

(5) Performance Standards if within a WCA or GWA:
See Section-3)0-7-1.7 (Clustering) for additional requirements.

Section 5. That Section 30-6-2, Coordination with Other Procedures, is hereby amended to read as follows:

To lessen the time required to attain all necessary approvals and to facilitate the processing of applications, an applicant may start the subdivision approval process simultaneously with applications for grading permits or other applications for approval required for a particular project. When a watershed development plan approval is required, ~~tha4-~~approval of all portions of that plan except stormwater control construction plans shall be a prerequisite to Preliminary Plat approval.

Section 6. That Section 30-6-9.2, is hereby amended to read as follows:

30-6-9.2 Permanent engineered stormwater ~~runoff~~ controls ~~structures~~ in subdivisions

(A) Coordination with Streets and Utilities: Any approved permanent engineered stormwater ~~runoff~~ controls ~~structure~~ may be installed prior to approval of street and utility construction plans. Such plans shall show the location of existing or proposed engineered stormwater ~~runoff~~ controls ~~structure~~ relative to the proposed improvements to avoid conflicts during construction and after.

(B) Design and Construction: Engineered stormwater ~~Runoff~~ controls ~~structures~~ shall be designed and installed in accordance with the requirements of Section 30-7-1 (Water Supply Watershed Districts).

Owners' Association Required: When a permanent engineered stormwater ~~runoff~~ control ~~structure~~ serves more than two lots within a subdivision, an owners' association shall be required for the purposes of ownership and maintenance responsibility.

Maintenance Responsibility:

- (1) Until the permanent engineered stormwater runoff control ~~structure~~ a) has been covered by an Engineer's Certification of Stormwater Control Completion (Table 30-7-1-36), b) has been granted final approval by the Enforcement Officer, and c) has been shown on a recorded final plat, the subdivider shall be responsible for its completion and its maintenance. Neither the posting of a guarantee of the structure's completion nor conveyance of the land containing the ~~runoff control~~ structure shall relieve the subdivider of this responsibility.
- (2) After the permanent engineered stormwater runoff control ~~structure~~ has been completed in accordance with Section 30-6-9.2(D)(1) of the Greensboro Development Ordinance and conveyed to the owners' association, the owners' association shall be responsible for maintaining it as directed by the governmental office having jurisdiction for watershed protection and, if the owners' association should be dissolved or cease to exist, then in that event all the lot owners of record at the time of the required maintenance shall be jointly and severally liable for any and all costs attendant thereto.
- (E) Maintenance Note Required on Final Plat: When a subdivision contains a permanent engineered stormwater runoff control ~~structure~~ to which subsection (C) above is applicable, each final plat in the subdivision shall contain a prominent note with the full text of subsection (D)(2) above.
- (F) Plat Recordation: If a subdivision lot is dependent upon an engineered stormwater runoff control ~~structure~~ to meet the requirements of Section 30-7-1 (Water Supply Watershed Districts), that ~~runoff control~~ structure's location and type must be shown on the same plat as the lot or on a plat recorded previously. If the runoff control structure has been completed, with full design volume available (this may require the cleanout and disposal of sediment from the pond), when the plat is recorded, it shall be labeled as existing and an Engineer's Certification of Stormwater Control Completion (Table 30-7-1 36) shall be filled out on the plat. If the structure has not been completed, it shall be labeled as proposed, assurance of its completion, with full design volume available, within one (1) year shall be provided in accordance with Section 30-3-9 (Sureties or Improvement Guarantees), and a prominent asterisk shall be placed on the lot accompanied by a note on the plat stating 1) that no certificate of compliance shall be issued for any

building on that lot until the engineered stormwater runoff
control ~~structure~~ has been completed, certified, and approved and
2) that (the name of the person) has posted a guarantee and bears
responsibility for its timely completion.

If the Enforcement Officer determines that there is a potential risk that underground rock, buried materials, springs, underground utility lines, or some other obstacle may make construction of the structure unviable, he shall require that excavation for the structure be successfully performed prior to acceptance of a surety or improvement guarantee.

Section 7. That Section 30-6-13.7, Drainage, is hereby amended to read as follows:

Drainage

General Requirements:

(1) Refer to Section 27-22 (Stormwater management control requirements) of the Greensboro Code of Ordinances for additional requirements that apply citywide and to Sections 30-7-1 (Water Supply Watershed Districts), 30-7-2 (General Watershed Areas), and 30-7-3 (Watershed Critical Areas) for additional requirements that apply in GWA and WCA areas.

All watercourses that lie within the city or within or

adjacent to developments provided with City water or sewer service pursuant to the City and County Consolidated Water and Sewer Line Agreement will carry a flow of five (5) cubic feet per second or more during a ten-year storm, as calculated in accordance with the City's storm sewer design manual, shall be treated in one or more of the three ways listed in Sections 30-6-13.7(B), (C), and (D) below. Except where Section 30-6-13.7(A)(2) below leaves the determination to the developer, the City Technical Review Committee shall determine the treatment(s) to be used, based upon the pipe size necessary to handle drainage and adopted drainage and open space plans or maps. Open drainage channel requirements shall be based upon a onehundred-year storm; enclosed systems shall be based upon a ten-year storm. If the area is identified on the drainageway and open space map or would require a pipe size of sixty-six (66) inch diameter or greater, the determination of drainage treatment(s) shall be made by the Technical Review Committee. In determining the drainage

treatment(s), the Technical Review Committee shall consider the following factors:

The type of development;

The drainage treatment(s) employed by nearby developments;

The probability of creating a lengthy greenway or drainageway and open space;

The probability of creating future maintenance problems;

The probability of erosion or flooding problems; and

The adopted drainageway and open space plan or map.

(3) If the area is not identified on the drainageway and open space plan or map and would require less than a sixty-six (66) inch diameter pipe, the developer shall determine the drainage treatment(s) in a manner consistent with this Section.

(B) Enclosed Subsurface Drains (Storm Sewers):

Storm sewer lines, connections, and facilities shall be designed and constructed in accordance with the City's storm sewer design manual.

A utility easement designed to accommodate storm sewer shall be dedicated on a Final Plat when determined necessary by the City. The required utility easement shall be centered on the enclosure when practical, but in no case shall the outside wall of the enclosure be located less than five (5) feet from the edge of the easement. The easement shall be of a width determined necessary for maintenance purposes by the City based upon enclosure depth, topography, and location of existing and proposed improvements, but in no case less than fifteen (15) feet.

Storm Sewer easements may be used for future installation of other underground utilities.

(C) Open Channels in Dedicated Drainageway and Open Space Areas
(See Appendix 5: Illustrations):

(1) Drainageway and open space shall be dedicated by a drainageway and open space ties within a proposed thoroughfare shown on the Thoroughfare Plan, it shall be labeled "Dedicated to the City of Greensboro and the public for Drainageway and Open Space or Thoroughfare."

(2) The dedicated drainageway and open space area along any stream that would require a sixty-six (66) inch or larger diameter pipe shall include the land between the natural one-hundred-year flood contour lines as determined by the City. The area to be dedicated may be reduced in width by filling provided that a minimum average width of two hundred (200) feet is maintained, a minimum width of one hundred (100) feet is maintained at the narrowest point is maintained, no fill is placed within a designated floodway, and no slope greater than three (3) to one (1) is created. The minimum average width in other locations shall be sixty (60) feet. (Caution: Article VII of this Ordinance, or Section- 27-22- (Stormwater management control' ' requirements), or federal wetlands regulations will prohibit or restrict fill placement in certain locations.)

(3) In cases of severe topography or other obstacles, additional width may be required to assure reasonable ease of maintenance.

(4) Dedicated drainageway and open space area shall abut public street right-of-way on at least thirty percent (30%) of its perimeter, except when the Technical Review Committee determines that adequate access is otherwise provided. The minimum length of street frontage at each location where drainageway and open space abuts public street right-of-way shall be sixty (60) feet. The maximum distance between such locations, measured by straight lines on each side of the drainageway, shall be one thousand (1,000) feet.

(5) The centerline of the drainage channel that would require a sixty-six (66) inch or larger diameter pipe shall be located no less than fifty (50) feet from any street or property line,

provided that the dimensions of the drainageway and open space area conform to all other requirements of this Section. The minimum distance from the centerline shall be twenty (20) feet along smaller drainageways.

(6) Dedicated drainageway and open space may be used for drainage, open space, greenways, bikeways, trails, and other similar recreation activities.

(7) Dedicated drainageway and open space may be used for utility lines provided the lines are shown on approved construction and utility plans before final plat recordation or approved by the -Parks and Recreation Department after final plat recordation.

(8) Drainageway and open space shall be left in its natural condition or graded to a cross section approved by the City and stabilized with permanent vegetative cover that will allow economical and efficient maintenance.

(9) Single family lots abutting property sixty (60) feet or more in width dedicated to the City and the public as drainageways and open space may be reduced in size in accordance with the provisions in Section 30-4-6. 1 (D) (Lots Adjoining Public Open Space). If lot sizes have been reduced under the provisions of that Section, the following note shall appear of the plat:

"The required area of Lots through _ has been reduced in accordance with Section 30-4-6.1 (D) of this Ordinance. All other dimensional requirements of this Ordinance shall apply."

Open Channels on Private Property Within Drainage Maintenance and Utility Easements:

(1) This treatment shall not be utilized in any subdivision intended for single family detached dwellings unless the Technical Review Committee determines that an open channel would not become a missing segment in a stormwater piping system and that the open channel is sufficiently distant from all anticipated building locations.

(2) The drainage maintenance and utility easement shall include the land between the natural one-hundred-year flood contour lines. The easement may be reduced in width

or shifted by modifying the topography if permitted under Section 30-7-4 (Soil Erosion and Sedimentation Control) and Section 30-7-5 (Flood Damage Prevention). In such cases, the approved typical required drainage channel section shall include the necessary channel to accommodate a one-hundred-year flood. The area outside of the required drainage channel may be filled; but any resulting slope shall be no steeper than two (2) to one (1), unless the slope is protected by masonry paving, rip-rap, or other material which meet the City's specifications.

(3) The minimum width of a drainage maintenance and utility easement shall not be less than specified below; If the edge of the easement as specified below and the edge of a stream buffer required in Section 30-7-1.8 (Stream buffer required) are close to coinciding, the Enforcement Officer may authorize the easement line to be moved to coincide with the stream buffer line.

Cubic feet per_second in 100-year storm	Drainage maintenance and utility easement width (feet)
5-17	30, centered
18-70	60, centered
> 70	100, plus width of channel

(4) The drainage maintenance and utility easement shall be centered on the drainageway unless the Technical Review Committee approves other easement alignments because of topographic conditions.

(5) In cases of severe topography or other obstacles, additional width may be required to assure reasonable ease of maintenance.

(6) If the Technical Review Committee determines that suitable access to the drainage maintenance and utility easement is not provided, access shall be guaranteed by a suitably located access easement not less than twenty (20) feet in width.

It shall be the ownees responsibility to maintain all streams and all required stream buffers located within the easement.

(8) If the City Council determines that it is in the public interest to alter the typical required channel section and/or profile of the stream to improve flow, the City may enter the property within the indicated access or drainage maintenance and utility easement and carry out the necessary work without liability for damage to the property or improvements located within the easement.

(9) No buildings or structures, except for water-related improvements, shall be placed or constructed within the access or drainage maintenance and utility easement except as allowed in Section 30-4-7.5 (Easement encroachments). Drives, parking areas, or other improvements shall be constructed no closer than two (2) feet horizontally from the top of any back slope along any open watercourse.

Section 8. That Sections 30-7- 1, Water Supply Watershed Districts, 30-7-2, General Watershed Areas, and 0-7-3, Watershed Critical Areas, are hereby amended to read as follows:

WATER SUPPLY WATERSHED DISTRICTS

330-7-1.1 District descriptions

Two overlay districts cover designated water supply watersheds. They are the Watershed Critical Area (WCA) and the General Watershed Area (GWA). The WCA covers the area adjacent to a water supply intake or reservoir where risk associated with pollution is greater than from the remaining portions of the watershed. No portion of the WCA outer boundary is closer than one-half (1/2) mile to the normal pool elevation of an existing or proposed designated reservoir. The GWA covers the rest of the watershed draining to the reservoir or intake.

Incorporation of Designated Water Supply Watershed Basin Map(s)

This Section incorporates by reference the Greensboro ~~Guilford County~~ Designated Water Supply Watershed Basin Map(s), dated January 1, 2000, ~~June 30, 1993~~ showing Watershed Critical Areas, and General Watershed Areas, and ~~perennial streams~~ of the following: Reidsville, Greensboro (Reedy Fork Creek), Upper Randleman Lake (East and West Forks of Deep River, which drain to High Point City Lake and Oak Hollow Lake), Lower Randleman Lake (Deep River), Lake Mackintosh (Big Alamance Creek), and Polecat Creek ~~High Point, Randleman, Randleman Dam, Burlington, Sandy Creek, and Dan River~~ watersheds.

(A) Coverage:

(1) This Section 30-7-1 (Water Supply Watershed Districts) applies to all sites containing new development in the Watershed Critical Area or General Watershed Area, including grading, paving, gravel placement, and construction of buildings and other structures, except for the exempt activities listed in Section 30-7-1.3)(B) below. Section 30-7-2 (General Watershed Areas) and Section 30-7-3 (Watershed Critical Areas) impose additional requirements specific to the overlay district.

(2) The construction of new streets by local government shall comply with best management practices developed in response to the City of Greensboro's EPA-NPDES Stormwater ~~Storm Water~~ Management Program, which is incorporated herein by reference.

(3) Widening of existing streets and the installation of sidewalks shall comply with the provisions of this Article to the extent practicable. When it is determined by the Enforcement Officer that the provisions of these sections cannot be met, the widening of existing streets and the installation of sidewalks shall comply with best management practices developed in response to the City of Greensboro's EPA-NPDES Stormwater ~~Storm Water~~ Management Program.

Exempt Activities: The following activities are exempt from the plan submission and approval requirements of this Section. However, any restrictions upon building location, drainageways, pavement, or other built-upon area, or any other matter appearing on any previously approved watershed development (watershed control) plan covering the subject property, shall be complied with unless and until replaced by an approved revised plan.

(1) Construction of a single family dwelling and its accessory structures on a zone lot outside WCA Tiers I and 2.

(2) Replacement of existing built-upon area with a like or lesser amount of new built-upon area at the same location, or at a different location on the same zone lot if the Enforcement Officer has determined that equal or improved water quality will result.

(3) Except as provided in Subsection (1) above, placement of small accessory buildings or structures or small amounts of other built-upon area provided that the total additional built-upon area is no greater than four hundred (400) square feet and the additional built-upon area is not placed within a required stream buffer. This exemption shall apply to a zone lot for one time only after June 30, 1993.

(4) Existing development until such time as new development is initiated on the site.

30-7-1.4 Participation in a public regional stormwater control ~~water quality lake~~ program

(A) Where Permitted: Where a regional stormwater control ~~water quality lake~~ program has been established by one or more local governments, or by an authority operating on behalf of one or more local governments, a development may participate in said program in lieu of any certification of stormwater runoff control required by this Article, provided that:

(1) The development is within an area covered by a public regional stormwater control ~~water quality lake~~ program;

(2) Stormwater Runoff from the development drains to an existing or funded public regional engineered stormwater control ~~water quality lake~~ which is part of said program;

Participation is in the form of contribution of funds, contribution of land, contribution of engineered stormwater control ~~lake~~ construction work, or a combination of these, the total value of which shall be in accordance with a fee schedule adopted by the City Council; and

(4) The Technical Review Committee finds that the watershed development plan is in compliance with all other applicable requirements of this Article.

Use of Contributions: Each contribution from a development participating in a public regional engineered stormwater control ~~water quality lake~~ program shall be used for acquisition, design, or construction of one or more such controls ~~lakes~~ in the same water supply watershed in which the development is located.

30-7-1.5 Watershed development plan

Plan Required:

- (1) For a two-family dwelling on a zone lot, a plot plan showing all proposed built-upon area, not to exceed 3,000 square feet, shall suffice in a GWA or WCA.
- (2) For all other new development in a GWA, a watershed development plan in accordance with the performance standards specified in Table 30-7-2-1 and with other requirements of Sections 30-7-1 and 30-7-2 shall be submitted to the Enforcement Officer.
- (3) For all other new development in a WCA, a watershed development plan in accordance with the requirements of Sections 30-7-1 and 30-7-3 shall be submitted to the Enforcement Officer.
- (4) Plans shall include all applicable information listed in Appendix 2 (Map Standards) of this Ordinance.

Plan Approval: The Technical Review Committee is authorized to approve watershed development plans which conform to the requirements of this Ordinance.

Approved Plan a Prerequisite: The Enforcement Officer is not authorized to issue any permits, except as provided in Section 303-4.2 (Permits issued prior to site plan or preliminary plat approval), for development on any land in a WCA or GWA unless and until a watershed development plan in compliance with the requirements of this Section has been approved.

(D) ~~Permanent Engineered Stormwater Runoff Controls Structures:~~
When a permanent engineered stormwater runoff control structure is required for a development to meet the requirements of this Article, a North Carolina registered professional engineer shall prepare the plan with the Engineer's Certification of Stormwater Quality Runoff Control from Table 30-7-1-52 affixed, signed, sealed, and dated.

Improvements

Design of Improvements:

Design of improvements shall:

- (a) Be performed by a North Carolina registered professional engineer;
- (b) Be subject to approval by the Enforcement Officer; and

Meet or exceed the guidelines in the watershed manual.

(2) The Enforcement Officer may recommend, and the Technical Review Committee may require, that a given engineered stormwater runoff control structure(s) be positioned on a site such that water quality protection is improved.

~~(3) The construction plans for required runoff control structures shall be approved prior to issuance of any building permit on a site.~~

Construction of Watershed Protection Improvements:

(1) See Section 30-6-9.2(F) (Plat recordation) if improvements are pursuant to a watershed development plan that was a prerequisite to a subdivision approval.

(2) The construction of all improvements designed for watershed protection and shown on other approved watershed development plans shall be substantially completed, ~~and~~ have full design volume available, and be functioning properly prior to any pond plat recordation or issuance of any building certificate of compliance.

(3) Final approval of installed engineered stormwater runoff controls structures shall be required at finalization of the grading permit or at issuance of the final building certificate of compliance, whichever comes later. If neither a building permit nor a grading permit is required for a site, then any such engineered stormwater required runoff control structure shall be substantially completed and have full design volume available prior to installation of any built-upon area on the site. An Engineer's Certification of Stormwater Control Completion (Table 30-7-1-~~36~~) shall be required prior to final approval by the Enforcement Officer.

(C) Recordation of Permanent Improvements: All permanent engineered stormwater runoff controls structures and associated

access/maintenance easement(s) (specific or general, at the owner's option) shall be recorded on a Pond Plat, and a mechanism to ensure their maintenance shall be established concurrent with or prior to plat recordation.

Maintenance Responsibility:

(1) When engineered stormwater runoff controls structures serve more than one lot, an owners' association or binding, contract for the purpose of maintenance shall be required. See Section 30-6-9.2 (Permanent runoff engineered stormwater controls structures in subdivisions).

(2) Maintenance of engineered stormwater runoff controls structures shall be performed at such time as the designated sediment storage volume of the structure has been lost to sediment or a part of the installation is not functioning as originally designed. The Enforcement Officer shall have the responsibility to inspect such runoff control structures annually, to record the results on forms approved or supplied by the NC Division of Water Quality, and to notify the responsible property owner or owners' association when maintenance or repairs are required. All required repairs and maintenance shall be performed within ninety (90) days after such notice. In case of failure by the responsible party to perform the required maintenance or repairs within the stated period, the City may perform such maintenance or repairs and recover all costs attendant thereto from the property owner or owners' association.

Clustering

Clustering Encouraged: Clustering of residential development is encouraged. Clustering of single family detached development is allowed under the provisions of Section 30-4-6.1 (B) (Single Family Detached Cluster Development). Multifamily development may be clustered so long as the development complies with the standards of Section 30-4-6.2 (Multifamily districts).

(B) Performance Requirements: Clustering is allowed if the overall density of the project meets the applicable GWA or WCA density and stormwater storm-water runoff control requirements, the built-upon areas are designed and sited to minimize stormwater storm-water runoff impact to the receiving waters and minimize concentrated stormwater storm-water flow, and the remainder of the tract remains in a vegetated or natural state.

Additional Performance Requirements in Lower Randleman Lake Watershed:

Development shall maximize the use of sheet flow through vegetated areas and shall maximize the flow length through vegetated areas.

Areas of concentrated development shall be located in upland areas and away, to the maximum extent practicable, from surface waters and drainageways.

The remainder of the tract to remain in a vegetated or natural state shall be conveyed to a property owners' association, conveyed to a local government for preservation as a park or greenway, conveyed to a conservation organization, or placed in a permanent conservation or farmland preservation easement. A document recorded at the Register of Deeds shall require maintenance of the vegetated or natural area.

Stream buffer required

(A) Stream Buffer Widths: in the WCA and the GWA, a stream buffers containing zones and widths as specified in Table 30-7-1 (Stream Buffer Zone and Width Requirements in Upper and Lower Randleman Lake Watersheds) and Table 30-7-2 (Stream Buffer Width Requirements in Other Water Supply Watersheds) below

~~with a minimum width as specified below, measured landward from the normal pool elevation of impoundments, and from the bank of each side of streams or rivers, shall be maintained, along all perennial waters.~~ (See Section 30-7-3 (Watershed Critical Area Requirements) for additional requirements concerning stream buffers in the WCA).

~~Thirty (30) feet in developments using the low density option.~~

~~One hundred (100) feet in developments using the high density option.~~

~~(B) Structures Permitted Within Stream Buffer: No new built-upon area is allowed in the stream buffer, except that water dependent structures, public projects such as street and driveway crossings, utility crossings, and runoff control devices may be allowed where no practicable alternative exists.~~

~~Installation of these structures shall minimize built-upon surface area, divert runoff away from surface waters, and maximize the use of runoff control structures.~~

~~(C)~~ Relationship to Requirements of Chapter 27: Where stricter stream buffer requirements are present in section 27-22(f) (Stream Buffer Requirement), the stricter requirements shall apply.

~~30-7-1-9~~ (C) Stream Channelization: In a GWA or WCA approval from the Technical Review Committee shall be secured before any intermittent or perennial stream is channelized. If the stream is perennial, ~~it streams in a WCA or GWA~~ shall not be channelized without prior approval by the Planning Board.

(D) Explanation of Randleman Zones and Other Stream Buffers:
Stream buffers in the Upper and Lower Randleman Lake watersheds may be composed of two or three of the following zones, depending upon whether the low density option or the high density option is used. Stream buffers required in other (non Randleman) water supply watersheds are not broken into zones:

(1) Randleman Zone 1 is the portion of a riparian protection area, required in the Upper and Lower Randleman Lake Watersheds, located closest to the stream. It is intended to be an undisturbed area of vegetation.

(2) Randleman Zone 2, the remainder of a riparian protection area, is intended to provide protection through a vegetated riparian zone which provides for diffusion and infiltration of runoff and filtering of pollutants.

(3) Randleman Zone 3 is not part of a riparian protection area and therefore is subject to less extensive requirements than are Randleman Zones 1 and 2. Randleman Zone 3 covers the outermost fifty (50) feet of one hundred (100) foot perennial stream buffers under the high density option in the Upper and Lower Randleman Lake watersheds.

A non-Randleman stream buffer covers the entire perennial stream buffer, be it thirty (30) feet under the low density option or one hundred (100) feet under the high density option, in other water supply watersheds.

TABLE 30-7-1
STREAM BUFFER ZONE AND WIDTH* REQUIREMENTS
IN UPPER AND LOWER RANDLEMAN LAKE WATERSHEDS

LOW DENSITY OPTION

<u>Watersheds</u>	<u>Perennial Streams, Lakes & Ponds</u>			<u>Intermittent Streams</u>		
	<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>	<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>
<u>Upper & Lower Randleman Lake</u>	<u>0-30</u>	<u>30-50</u>	<u>N/A</u>	<u>0-30</u>	<u>30-50</u>	<u>N/A</u>

HIGH DENSITY OPTION

<u>Watershed</u>	<u>Perennial Streams, Lakes & Ponds</u>			<u>Intermittent Streams</u>		
	<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>	<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>
<u>Upper & Lower Randleman Lake</u>	<u>0-30</u>	<u>30-50</u>	<u>50-100</u>	<u>0-30</u>	<u>30-50</u>	<u>N/A</u>

TABLE 30-7-2
STREAM BUFFER WIDTH* REQUIREMENTS
IN OTHER WATER SUPPLY WATERSHEDS

LOW DENSITY OPTION

<u>Watersheds</u>	<u>Perennial Streams, Lakes & Ponds</u>	<u>Intermittent Streams</u>
<u>Greensboro</u>	<u>0-30</u>	<u>N/A</u>
<u>Lake Mackintosh</u>	<u>0-30</u>	<u>N/A</u>
<u>Polecat Creek</u>	<u>0-30</u>	<u>N/A</u>

HIGH DENSITY OPTION

<u>Watershed</u>	<u>Perennial Streams, Lakes & Ponds</u>	<u>Intermittent Streams</u>
<u>Greensboro</u>	<u>0-100</u>	<u>N/A</u>
<u>Lake Mackintosh</u>	<u>0-100</u>	<u>N/A</u>
<u>Polecat Creek</u>	<u>0-100</u>	<u>N/A</u>

*Distances on all sides of water bodies are in feet and are with reference to top of bank for streams and normal pool elevation for all other water bodies. Thus, "0" equals top of bank or normal pool elevation and "30" equals 30 feet landward from top of bank or normal pool elevation.

(E) Structures, Uses, Practices, and Activities Allowed in Randleman Zone 1:

Natural regeneration of forest vegetation and planting

vegetation to enhance the riparian area if disturbance is minimized, provided that any planting shall primarily consist of locally native trees and shrubs;

Selective cutting of individual trees, where forest

vegetation as defined in Rule .0202 of the ENIC Rules exists, as long as the following conditions are met every one hundred (100) feet on each side of the stream:

Of existing trees twelve (12) inches and greater in diameter breast height (dbh), a minimum of five (5) trees must remain uncut;

Trees twelve (12) inches and greater dbh may be harvested based on the following equation:

Number of Trees Harvested = (Total Number of Trees Greater than 12 Inches dbh - 5)/2;

No trees less than twelve (12) inches dbh may be harvested unless exceptions provided in this section are met;

Trees may not be harvested more frequently than every ten years; and

No tracked or wheeled equipment is allowed.;

Horticulture or silvicultural practices to maintain the health of individual trees;

Removal of individual trees which are in danger of causing damage to dwellings, other structures, or the stream channel;

Removal of dead trees and other timber cutting techniques necessary to prevent extensive pest or disease infestation if recommended by the Director, NC Division of Forest Resources and approved by the Director, NC Division of Water Quality;

Ongoing agricultural operations provided that existing forest vegetation is protected;

Water dependent structures, road crossings, driveway crossings, railroad crossings. Bridges, airport facilities, utility crossings, stream restoration projects, scientific studies, stream gauging, and passive recreation facilities such as boardwalks, trails, pathways, historic preservation and archeological activities where no practical alternative exists. These structures shall be located, designed, constructed, and maintained to have minimal disturbance, to provide maximum nutrient removal and erosion protection, to have the least adverse effects on aquatic life and habitat, and to protect water quality to the maximum extent practical through the use of best management practices; and

Stream crossings associated with timber harvesting, i performed in accordance with the Forest Practices Guidelines Related to Water Quality (I 5A NCAC I J .0201,0209).

Practices and Activities Not Allowed in Randleman Zone 1:

Land-disturbing activities and placement of fill and other materials, other than those allowed elsewhere in this Section;

New development, except as allowed elsewhere in this Section;

New on-site sanitary sewage systems which use ground adsorption;

Application of fertilizer; and

Any activity that threatens the health and function of the vegetation, including, but not limited to, application of chemicals in amounts exceeding the manufacturer's recommended rate, deposition of sediment from uncontrolled sediment sources on adjacent lands, and creation of any areas with bare soil.

Structures, Uses, Practices, and Activities Allowed in Randleman Zone 2:

(1) All those permitted in Randleman Zone 1;

Periodic mowing and removal of plant products such as timber, nuts, and fruit, provided the purpose of the riparian area is not compromised by harvesting, disturbance, or loss of forest and herbaceous ground cover;

Grading and timber harvesting, provided that vegetative ground cover is established immediately following completion of land-disturbing activity;

Storm-water management facilities and ponds;

Corridors for the construction and management of utility lines, such as water, sewer or gas, (including access roads and stockpiling of materials) running parallel to the stream, as long as no practical alternative exists and best management practices are used to minimize runoff and maximize water quality protection to the maximum extent practicable. Permanent, maintained access corridors shall be restricted to the minimum width practicable and shall not exceed ten (10) feet in width except at manhole locations. A ten (10) feet by ten (10) feet perpendicular vehicular turnaround shall be allowed provided they are spaced at least five hundred (500) feet apart along the riparian area; and

Stream, restoration projects, scientific studies, stream gauging, water wells, and passive recreation facilities such as boardwalks, trails, pathways, historic preservation and archeological activities, provided that they are designed, constructed, and maintained to provide the maximum nutrient removal and erosion protection, to have the least adverse effects on aquatic life and habitat, and to protect water quality to the maximum extent practical through the use of best management practices.

Practices and Activities Not Allowed in Randleman Zone 2:

New development, other than that allowed elsewhere in this Section; and

(2) Those uses listed in Sections 30-7-1.8(F)(3) and (5) above.

(I) Timber Removal in Randleman Zones I and 2: Timber removal and skidding of trees shall be directed away from the water course or water body. Skidding shall be done in a manner to prevent the creation of ephemeral channels perpendicular to the water body. Any tree removal must be performed in a manner that does not compromise the purpose of the riparian area and is in accordance with the Forest Practices Guidelines Related to Water Quality (15A NCAC 1J.0201-.0209).

(J) Maintenance of Sheet Flow in and Entering Randleman Zones 1 and 2:

Sheet flow must be maintained to the maximum extent practical through dispersing concentrated flow and re-establishment of vegetation to maintain the effectiveness of the riparian area.

Concentrated runoff from new ditches or manmade conveyances must be dispersed into sheet flow before the runoff enters Randleman Zone 2 of the riparian area. Care shall be taken to minimize pollutant loading through existing ditches and manmade conveyances from fertilizer application or erosion.

Periodic corrective action to restore sheet flow shall be taken by the landowner if necessary to impede the formation of erosion gullies which allow concentrated flow to bypass treatment in the riparian area.

Maintenance of Modified Natural Streams in Randleman Zones 1 and 2: Periodic maintenance of modified natural streams such as canals is allowed provided that disturbance is minimized and the structure and function of the riparian area is not compromised. A grassed travelway is allowed on one side of the water body when alternative forms of maintenance access are not practical. The width and specifications of the travelway shall be only those needed for equipment access and operation. The travelway shall be located so as to interfere as little as practical with stream shading.

Structures, Uses, Practices, and Activities Allowed in Randleman Zone 3 and in Non-Randleman Stream Buffers:

All those permitted in Randleman Zone 2, and

Water dependent structures, public projects such as street, railroad and driveway crossings, airport facilities, utility crossings and corridors, and stormwater management facilities and ponds may be allowed where no practicable alternative exists. Installation of these structures shall minimize built-upon area, divert runoff away from surface waters, and maximize the utilization of best management practices.

Structures and Uses Not Allowed in Randleman Zone 3 and in Non-Randleman Stream Buffers: No new built-upon area, other than that permitted in Section 30-7-1.8(L) above, is allowed.

Planting of Stream Buffers: Subdivision plats and pond plats shall show each stream buffer and Randleman zone applicable to the property.

(O) Alternatives to the Maintenance of Riparian Protection Area

Buffers: The alternatives listed in this Section are established to accommodate situations where a buffer would otherwise be required, but where it can be demonstrated that there is no practical alternative to the loss of the buffer in spite of efforts to avoid such loss. This is intended to allow, in such situations, compensatory mitigation in lieu of complying with Ordinance requirements that riparian buffers be protected and maintained. Technical Review Committee approval is a prerequisite to the use of any alternative for any property. Expenditure of collected fees shall occur on property in the same river basin as the riparian buffer that is lost. Each other alternative measure shall occur on property in the Upper Cape Fear river basin. Alternatives shall include, but are not limited to:

Payment of a compensatory mitigation fee, according to the fee schedule, into the Riparian Buffer Restoration Fund managed by the NC Division of Water Quality;

Donation of real property or an interest in real property to the NC Department of Environment and Natural Resources, another state agency, the City of Greensboro, or a private, nonprofit conservation organization if both the donee organization and the donated real property or interest in real property are approved by the Technical Review Committee. The donee organization shall be approved only if the donee agrees to maintain the real property or interest in real property as a riparian buffer. The Technical Review Committee may approve a donation only if the donation:

Is a riparian buffer that will provide protection of water quality that is equivalent or greater than that provided by the riparian buffer that is lost; or

Will be used to restore, create, enhance, or maintain a riparian buffer that will provide protection of water quality that is equivalent to or greater than that provided by the riparian buffer that is lost;

Restoration or enhancement of an existing riparian buffer that is not otherwise required to be protected, or creation of a new riparian buffer, that will provide protection of water quality

that is equivalent to or greater - than that provided by the riparian butfer that is lost. And

Construction of an alternative measure that reduces nutrient loading as well as or better than the riparian buffer that is lost.

Additional Requirements in Lower Randleman Lake Watershed:

Vegetated Conveyances: When the low density option is used in the GWA or WCA of this watershed, stormwater runoff shall be transported primarily by vegetated conveyances. This shall be done to the maximum extent practicable in cluster developments.

Minimization of Impacts of Built-Up Area: To the extent that this can be accomplished consistent with other requirements of the Development Ordinance, built-upon area shall be minimized to the maximum extent practical through clustering and narrower and shorter paved areas (streets, driveways, sidewalks, and parking lots). Rooftop and other built-upon area runoff shall be spread over pervious areas.

Land Clearing Limitation: Land clearing during the construction process shall be limited to the maximum extent practical.

Deed Restrictions To Be Recorded: The developer shall record deed restrictions and protective covenants to ensure that development activities-maintain the development consistent with the approved plans and specifications.

Activities Regulated by Other Governmental Agencies

Designated Agencies: The following are the designated agencies responsible for implementing the requirements of the EMC Rules for the specified activities:

Agriculture - Guilford Soil and Water Conservation District

(2) Silviculture - NC Division of Forest Resources

Transportation: The North Carolina Department of Transportation shall comply with the practices outlined in its document entitled "Best Management Practices for the Protection of Surface Waters," which is incorporated by reference.

Hazardous Materials:

(1) The Greensboro Emergency Management Assistance Agency and the Guilford County Local Emergency Planning Committee (LEPC) are the designated management agencies responsible for implementing the provisions of this subsection pertaining to hazardous materials.

(2) An inventory of all hazardous materials used and stored in the watershed shall be maintained. A spill/failure containment plan and appropriate safeguards against contamination are required. Waste minimization and appropriate recycling of materials is encouraged.

(3) Properties in the WCA or GWA shall comply with the requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 302 Extremely Hazardous Substances (42 USC I 1000 et seq.), or Section 311 of the Clean Water Act, as amended (CWA)(33 USC 1251 et seq.; oil and hazardous substances) if hazardous substances listed in either of these sections are stored or used on the site.

Density

Density Limits: New development shall not exceed the density limits in Table 30-7-1-3 (Density Limits in Upper and Lower Randleman Lake Watersheds) or Table 30-7-1-4 (Density Limits in Other Water Supply Watersheds), whichever is applicable ~~below~~.

(B) Measurement in Low Density Option: For the low density option, density is measured in dwelling units per acre for single family detached residential development; for recreational facilities such as golf courses and tennis and swim clubs lying within such developments, measure the built-upon area on the lot or common area and divide by 3,000 square feet to obtain a dwelling units equivalency number. Density is measured in percentage of the land surface covered by built-upon area for all other residential and nonresidential development. When buildings for single family detached residential uses and buildings for other uses are intermingled, the built-upon area measurement shall apply. When sections devoted to single family detached residential buildings and other sections devoted to buildings for other uses are present in the same development, the developer may apply the appropriate measurements to the different uses or may use the built-upon area measurement for the entire development. When using the built-upon area measurement, assume 3,000 square feet of built-upon

area per single family detached residential lot to cover the built-upon area on the lot and in the portion of its driveway within the street right-of-way.

(C) Measurement in High Density Option: The built-upon area measurement shall apply.

TABLE 30-7-1-34.

DENSITY LIMITS IN UPPER AND LOWER RANDLEMAN LAKE WATERSHEDS
FOR LOW DENSITY AND HIGH DENSITY OPTIONS
 IN DWELLING UNITS PER ACRE & % BUILT-UPON AREA

Watershed Classification	Overlay Zone & Tier	Low Density <u>Option</u>		High Density <u>Option</u>	
		DU/AC	% BUA	% BUA*	
<u>Lower</u> <u>Randleman Lake</u> <u>(WS-IV Critical</u> <u>Water Supply)</u>	<u>GWA</u>	<u>1***</u>	<u>12</u>	<u>50</u>	
	<u>WCA, 1</u>	<u>See BUA</u>	<u>0.5</u>	<u>no HD option</u>	
	<u>WCA,2</u>		<u>0.2</u>	<u>2.4</u>	<u>no HD option</u>
	<u>WCA,3,sewer</u>	<u>0.5</u>	<u>6</u>	<u>30</u>	
	<u>no sewer</u>	<u>0.33</u>	<u>4</u>	<u>no HD option</u>	
	<u>WCA,4,sewer</u>		<u>1***</u>	<u>12</u>	<u>40</u>
	<u>no sewer</u>		<u>1***</u>	<u>12</u>	<u>no HD option</u>
	<u>GWA</u>	<u>2***</u>	<u>24</u>	<u>70</u>	
	<u>WCA,1</u>	<u>See BUA</u>	<u>0.5</u>	<u>no HD option</u>	
	<u>WCA,2</u>		<u>0.2</u>	<u>2.4</u>	<u>no HD option</u>
<u>Upper</u> <u>Randleman Lake</u> <u>(WS-IV Critical</u> <u>Water Supply)</u>	<u>WCA,3,sewer</u>	<u>2***</u>	<u>24</u>	<u>34</u>	
	<u>no sewer</u>	<u>0.33</u>	<u>4</u>	<u>no HD option</u>	
	<u>WCA,4,sewer</u>	<u>2***</u>	<u>24</u>	<u>40</u>	
	<u>no sewer</u>		<u>1***</u>	<u>12</u>	<u>no HD option</u>

*In a subdivision, the BUA maximum applies to the subdivision as a whole, including streets, lots, etc. The maximum BUA allowed by this column (assuming engineered stormwater runoff controls structures are large enough) shall be allocated among streets, lots, etc. In single family detached development, the allocation to each house lot shall be uniform. In other development, the allocation may vary among lots. In all cases, the final plat shall clearly state each lot's allocation and restrictive covenants shall call attention to these allocations. On new or extended thoroughfare streets, allocate enough BUA to cover 5 foot sidewalks on both sides; and on all other new or extended streets allocate enough to cover a 5 foot sidewalk on one side.

**Alternatively, if total area minus area in street right-of-way, divided by number of house lots, equals 20,000 square feet or more, that is Low Density.

***Alternatively, if total area minus area in street right-of-way, divided by number of house lots, equals 40,000 square feet or more, that is Low Density.

In making determinations whether modification requests are minor or major, remember that all Greensboro's WCA Tier 4 and the portion of its Tier 3 lying more than 1/2 mile from normal pool elevation are beyond the minimum WCA required by JEMC Rules.

TABLE 30-7-1-44.

DENSITY LIMITS IN OTHER WATER SUPPLY WATERSHEDS
IN DWELLING UNITS PER ACRE & % BUILT-UPON AREA

Watershed Classification	Overlay Zone & Tier	Low Density <u>Option</u>		High Density <u>Option</u>	
		DU/AC	%BUA		%BUA*
<u>Greensboro & Polecat Creek</u> (WS-III)	GWA	2**	24	50(70')	
WS-III	WCA,1	See BUA		0.5	no
HD option					
WCA,2	0.2	2.4	no HD option		
	WCA,3,sewer	1***	12	30	
	no sewer	0.33	4	no HD option	
	WCA,4,sewer	2**	24	40	
	no sewer	1***	12	no HD option	
<u>Lake Mackintosh</u> (WS-IV)	GWA	2**	24		70
WS-IV	WCA,1	See BUA		0.5	no
HD option					
	WCA,2	0.2	2.4		no
HD option					
	WCA,3,sewer	2**	24		34
	no sewer	0.33	4	no HD	
option					
	WCA,4,sewer	2**	24		
40					
	no sewer	1***	12	no HD	
option					

"Watershed plans approved on and after October 31, 1997, collectively covering up to 10% of the WS-III GWA, may receive allocations permitting up to 70% *BUA*. An approved watershed plan constitutes a completed application for such an allocation. An allocation is granted to a lot when a building permit is issued thereon and to a part of a subdivision when the engineered stormwater runoff control structure for it has been substantially completed. An allocation is lost if the building permit or plat approval expires or is revoked.

*In a subdivision, the *BUA* maximum applies to the subdivision as a whole, including streets, lots, etc. The maximum *BUA* allowed by this column (assuming engineered stormwater runoff controls structures are large enough) shall be allocated among streets, lots, etc. In single family detached development~ the allocation to each house lot shall be uniform. In other development, the allocation may vary among lots. In all cases, the final

plat shall clearly state each lot's allocation and restrictive covenants shall call attention to these allocations. On new or extended thoroughfare streets, allocate enough BUA to cover 5 foot sidewalks on both sides; and on all other new or extended streets allocate enough to cover a 5 foot sidewalk on one side.

* *Alternatively, if total area minus area in street right-of-way, divided by number of house lots, equals 20,000 square feet or more, that is Low Density.

* * *Alternatively, if total area minus area in street right-of-way, divided by number of house lots, equals 40,000 square feet or more, that is Low Density.

In making determinations whether modification requests are minor or major, remember that all Greensboro's WCA Tier 4 and the portion of its Tier 3 lying more than 1/2 mile from normal pool elevation are beyond the minimum WCA required by EMC Rules.

Table 30-7-1-52
ENGINEER'S CERTIFICATION OF RUNOFF STORMWATER QUALITY CONTROL

The engineer's certification is required on the watershed development plans and stormwater control construction plans portion of the watershed development plans drawings when a permanent stormwater quality control is proposed. The certification shall be of the following form:

<p align="center">ENGINEER'S CERTIFICATION OF <u>STORMWATER QUALITY RUNOFF CONTROL</u></p> <p>I certify that this plan has been designed to control runoff from the first inch of rainfall from areas that are required to be controlled per in Section 30-7-1.12 of the Greensboro Development Ordinance from the first inch of rainfall and has been designed to achieve 85% total suspended solids (TSS) removal and that the runoff control measures shown on this plan is controlled by a permanent engineered stormwater quality control that has been designed to meet or exceed the guidelines requirements in the Greensboro Watershed Stormwater Management Manual.</p> <p align="right">P.E. SEAL _____ SIGNATURE _____ DATE _____</p>

Table 30-7-1-63
ENGINEER'S CERTIFICATION OF STORMWATER CONTROL COMPLETION

The engineer's certification, required according to Section 30-7-1.6(B) of the Greensboro Development Ordinance and Section 27-22(e) of the Stormwater Management Ordinance upon completion of permanent runoff stormwater control structures, shall be of the following form:

<p align="center">ENGINEER'S CERTIFICATION OF <u>STORMWATER CONTROL COMPLETION</u></p> <p>I certify that the permanent stormwater runoff control(s) structure <u>labeled as _____ on this plat (or, on (name of plat) as recorded in PB __, PG __ in the Office of the Guilford County Register of Deeds) has been completed in conformance with the plans and specifications approved on (approval date), and has its full design volume available, and is functioning as designed.</u></p> <p align="right">P.E. SEAL _____ SIGNATURE _____ DATE _____</p>
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TABLE 30-7-2-1
GENERAL WATERSHED AREA PERFORMANCE STANDARDS

Development Type	Schedule
1) Low Density Option (see Tables 30-7-1-34 & 30-7-1-4 for density limits)	General Watershed Area Scoresheet (Table 30-7-2-2). A passing score is 120 or more points; or Engineer's Certification
2) High Density Option	Engineer's Certification

Notes:
1) For the form of the Engineer's Certification, see Table 30-7-1-52 (Engineer's Certification of Stormwater Quality Runoff Control).

**TABLE 30-7-2-2
GENERAL WATERSHED AREA PERFORMANCE SCORESHEET**

MAXIMUM POINTS	FACTOR	POINT VALUE	POINTS EARNED
25	1. Clustering		
	Minimal	10	
	Moderate	15	
	Major	20	
	Exceptional	25	
25	2. Built-Up Area		
	0-3%	25	
	3.01-7%	20	
	7.01-10%	15	
	10.01-15%	10	
	15.01-20%	5	
25	3. Proximity to Floodway as Defined by FEMA		
	More than 2000 Feet	25	
	1000-2000 Feet	20	
	500-1000 Feet	15	
	100-500 Feet	10	
	50-100 Feet	5	
10	4. Soil Limitations as Defined on Pg.29 and Tbl. 7,Pg.57 Guil. Co. Soil Survey		
	Slight	10	
	Moderate	5	
25	5. Drainage - Protect and Use Natural Drainageways		
	Piped or Improved Drainage With Riprap	5	
	Dispersed Drainage or Protected Drainageways	10	
	Dispersed Drainage and Protected Drainageways (or Dispersed and No Drainageway)	20	
	Enhanced and Protected Natural Drainageways	25	
25	6. Average Pre-development Slope of Land Subject to Grading or Filling		
	0-6%	25	
	6.01-10%	20	
	10.01-15%	5	
25	7. Stream Buffer Along Drainageways		
	No Drainageway Present on Property or Within 50 Feet	25	
	50 Feet, All Wooded Except For Sewers And Required Streets	25	
	50 Feet ,At Least Half Wooded	20	
	50 Feet, No Grading or Fill Except For Sewers and Required Streets	15	
	40 Feet, Same Restriction	10	
25	8. Stormwater (Runoff) Control Strategies		
	Divide the % of Stormwater (Runoff) Controlled by 4		
10	9. Sewage Disposal		
	Public Sewer Service	10	
10	10. Street & Driveway Design		
	With Vegetated Ditches	10	
	With Piped Drainage and/or Curb and Gutter and Energy Dissipaters	5	
33	11. Wooded Area		
	Divide the % of Tract To Remain Wooded by 3 and To Be Thickly Planted in Tree Stands by 6		
	12. Grading Reduction and Other Bonuses		
	NR:<1 Driveway per 300 Feet of Frontage	5	
	All:Creation of Wetlands	Up to 20	
	All:Other Measures	Up to 10	
	Total		

Notes: 1) All plans must have at least 120 points and meet all other requirements to be approved.
2) Use this table for low density option only.

SUBMISSION REQUIREMENTS

SUBDIVISIONS: Rated prior to approval of preliminary plat.

SITE PLANS: Rated prior to approval of site plan unless lot was prequalified by subdivision.

PROJECTS WITHOUT SITE PLANS: Rated prior to approval of the building permit

DEFINITIONS, EXPLANATIONS, AND STANDARDS

1. *Minimal Clustering* means: in SF that there is 15% or more open space; in MF & NR that buildings and parking are concentrated away from streams and steep slopes.

Moderate Clustering means: in SF that there is 25% or more open space; in MF that the Minimal Clustering criteria are met and that at least half of the units are in buildings of 2 stories or more; in NR that Minimal Clustering criteria are met and that parking uses 17 foot space depth and 24 foot aisles, or 8.5 foot space width.

Major Clustering means: in SF that there is 35% or more open space or that average lot size is no more than 2,000 sq. ft. larger than the minimum allowed; in MF that at least 75% of the units are in buildings of 2 stories or more, that the number of parking spaces is no more than 5% higher than the Ordinance minimum, and that there is no BUA that could be marked to form additional parking spaces; in NR that the Moderate Clustering Criteria are met, as are the same parking requirements as in MF.

Exceptional Clustering means: in SF that there is 45% or more open space or that average lot size is no more than 1,000 sq. ft. larger than the minimum allowed; in MF that the Major Clustering criteria are met and that all units are in buildings of 2 stories or more and some are in buildings of 3 stories or more; in NR that the Major Clustering criteria are met and that at least 20% of the parking spaces are inside buildings of 2 stories or more.

3. If land is dedicated to the City a~ drainageway and open space, measure from the downhill edge of the land not dedicated. If a street crossin- that dedication is required by the City, ignore it in measuring.

5. *Protected Drainageway* means drainage is channeled by pervious devices such as sod waterways, berms, channels, or swales which have been constructed to resist soil erosion by either vegetating, netting, rip-rapping, or a combination of those, and which allows infiltration of water into the soil.

Dispersed Drainage means spread out, as opposed to collecting the runoff in channels, so as to effect increased sheet flow and overland flow.

Improved Drainageway means channeled by impervious surfaces such as curb and -utter or concrete (gunnite, bituminous, etc.) channels.

Enhanced Drainageway means carried by existing natural drainageway which have been enhanced to resist soil erosion, including stream bank degradation.

6. *Average Slope* means the maximum inclination of the land surface from the horizontal as measured in percentage slope.

Land is Subject to Grading or Filling if it is in street R/W, in a lot or common area but not covered by a water quality conservation easement, or in an area that will be disturbed before being dedicated to the public.

9. No points will be allowed for on-site septic tank systems or private sewage treatment systems.

11. *Thickly Planted in Tree Stands* means that trees (but not shrubs) are planted at a Type A number and size planting rate. [Sample Calculation: if 30% remains wooded, $30 \div 3 = 10$ points; and if another 18% is thickly planted in tree stands, $18 \div 6 = 3$ points; total score is 13 points.)

12. *Other Measures* are measures not covered above but which are deemed effective by, and assigned up to 10 total points by, the TRC.

Abbreviations: BUA= built-upon area, SF= single family detached, MF= multifamily, NR= nonresidential, All= all types

Stormwater Quality ~~Runoff~~ Controls

What Stormwater (Runoff) Is To Be Controlled: Where stormwater ~~runoff~~ control is required by this Article, runoff from the following shall be controlled, and engineered stormwater ~~runoff~~ controls structures and other best management practices (BMPs) shall be sized accordingly.

- (1) New built-upon area and other new development on the site (but see #4 below);
- (2) To the extent practicable, existing development on the site (consult with the Enforcement Officer for a determination);
- (3) Any other on-site runoff that happens to flow into the structure or BMP;

Any off-site runoff that happens to flow into the structure or BMP; if untreated built-upon area runoff from off the site is included, then the Technical Review Committee may permit control of that runoff to offset non-control of a lesser, modest amount of on-site built-upon area runoff that would be difficult to control.

(B) Methods of Stormwater Quality ~~Runoff~~ Control:

- (1) Developments using the high density option shall use engineered stormwater controls, which may consist of wet detention ponds or alternative stormwater management systems consisting of other treatment options, ~~BMP's~~ or a combination of options approved by the Director of the Division of Water Quality in accordance with 15A NCAC 2B .0104(g). The design criteria for approval shall include meeting the performance standards of control of the first one inch (I") of rainfall and eighty-five percent (85%) total suspended solids (TSS) removal, as well as discharge rate.

Developments using the low density option, if they are required to have stormwater ~~runoff~~ control, shall use either a method allowed under the high density option or, as applicable, a method prescribed in Section 30-7-2 or 30-7-3.

30-7-2 GENERAL WATERSHED AREAS (GWA)

30-7-2.1 General Provisions

(A) Performance Standards: The watershed development plan for any new development in the GWA shall be prepared and submitted in accordance with the requirements in Table 30-7-2-1 (General Watershed area Performance Standards).

(B) Stormwater Quality Runoff Control: For developments using the high density option, see Section 30-7-1.12(B)(1) in Methods of Stormwater Quality Runoff Control. Developments using the low density option may use a method allowed in that section or a retention pond, natural infiltration area, filter basin, or other BMP found by the Enforcement Officer to be similarly effective.

30-7-2.2 Prohibited Uses

No new discharging landfills shall be permitted.

30-7-3 WATERSHED CRITICAL AREAS (WCA)

30-7-3.1 General Provisions

Watershed Critical Area: The Watershed Critical Area is a district covering the portion of the watershed adjacent to a designated existing or proposed water supply intake or reservoir where risk associated with pollution is greater than from the remaining portions of the watershed. The WCA boundary shall not be less than one-half (1/2) mile from the normal pool elevation and draining to existing or proposed designated reservoirs.

Divisions Within the Watershed Critical Area: The WCA consists of four divisions as follows:

Tier 1:

(a) Tier 1 consists of those lands within two hundred (200) feet of the existing or proposed normal pool elevation and those lands within one-half (1/2) mile (High Point Lake, Oak Hollow Lake, Lake Brandt) or one mile (Lake Townsend) upstream of water intake structure(s).

(b) Tier 1 areas are intended for public purpose and should remain undisturbed.

(3) Tier 2:

- (a) Tier 2 consists of those lands lying within an area bounded by Tier 1 and a line parallel to and seven hundred and fifty (750) feet from the normal pool elevation.
 - (b) Tier 2 areas are intended primarily for public purpose. ~~with the following exception. Tier 2 areas surrounding the proposed reservoir at Randleman Lake and intended for public purpose unless and until more than twenty-five percent (25%) of the WCA for the reservoir becomes urban in character, by meeting any of the tests defined in NCGS Section 160A-48(c).~~
- (3) Tier 3: Tier 3 consists of those lands lying within an area bounded on its inner edge by Tier 2 and on its outer edge by a line parallel to and 3,000 feet from the normal pool elevation, or by the WCA boundary, whichever comes first.
- (4) Tier 4: Tier 4 consists of those lands lying in the area between the outer boundary of Tier 3 and the WCA boundary.

30-7-3.2 Land Disturbance Minimization

- (A) Soil Erosion and Sedimentation Control Plan: See Section 30-7-4.1 (General requirements) to determine when a soil erosion and sedimentation control plan is required.
- (B) Street Standards: Refer to Article VI (Subdivisions: Procedures and Standards) for the minimum street standards. To the extent practicable, the construction of new roads in the WCA should be avoided.
- (C) Land Disturbance:
 - (1) No land-disturbing activity is allowed within stream buffers, open channel drainageways carrying seventeen (17) cubic feet per second or more based upon the 100-year storm event, fifteen percent (15%) slopes adjacent to drainageways, or water quality conservation easements, except for utilities, watershed devices, and street crossings.

- (2) Cut or fill activities resulting in slopes of twenty-five percent (25%) or more are not allowed, except to meet minimum safety standards for roadways or minimum building code or health code requirements.
- (3) The transfer of stormwater from a drainage area of five acres or greater by piping or channeling between sub-basins within the WCA is not permitted unless approved by the Technical Review Committee. The piping or channeling of stormwater from a WCA to a GWA or to a non-watershed basin is allowed.
- (4) Land Disturbance Limits: The maximum percentage of the usable property that may be disturbed shall be as shown below. The usable property consists of that property not lying in any of the following: stream buffers, open channel drainageways carrying 17 cubic feet per second or more in a 100-year storm, 15 percent slopes adjacent to drainageways, water quality conservation easements, flood plains, or natural wetlands.

<u>Tier 1</u>	<u>10%</u>
<u>Tier 2</u>	<u>10%</u>
<u>Tier 3</u>	<u>60%</u>
<u>Tier 4</u>	<u>75%</u>

(DC)— Protection of Fragile Areas:

- (1) Slopes Greater Than Fifteen Percent and Wetlands
 - (a) Slopes greater than fifteen percent (15%) lying adjacent and parallel to natural drainageways or streams, and wetlands, shall remain in a natural and undisturbed condition except for road crossings, utilities, soil erosion and sedimentation control devices, and runoff control devices.
 - (b) Dedication of these areas to the local jurisdiction and the public as drainageway and open space may be required wherever authorized by Article VI (Subdivisions: Procedures and Standards) or any other provision in local ordinances.
 - (c) Where such dedication is not required, a water quality conservation easement shall be platted over such wetlands and slopes. Within this easement the

natural ground cover and the natural tree canopy must be preserved, with the following exceptions:

- (i) the cutting or trimming of overcrowded trees is allowed provided that no trees in excess of three (3) inches in diameter as measured twelve (12) inches from the ground are removed;
 - (ii) utilities and erosion control structures can be constructed and maintained;
 - (iii) normal maintenance by mechanical means is allowed for the removal of dead, diseased, deformed, poisonous, or noxious vegetation and pests harmful to health; ~~and~~
 - (iv) mechanical mowing of utilities areas is allowed to control growth; ~~and~~.
 - (v) Nothing in this Subsection shall supersede the stream buffer requirements of Section 30-7-1.8 (Stream buffer required).
- (d) Where a water quality conservation easement serves to bring two (2) or more properties into compliance with WCA requirements, the Technical Review Committee may require that the wetlands and slopes covered by such easements be held as common area by an owners' association.

(2) Drainage

- (a) Drainage shall be provided by means of open channels.
- (b) All such areas shall have protected channels or remain in a natural and undisturbed state, except for road crossings, utilities, soil erosion and sedimentation control devices, and runoff control devices.
- (c) The undisturbed area width shall be the easement width as specified in Article VI (Subdivisions: Procedures and Standards).

- (D) Soils and Terrain: Development on the best soils and terrain of any site is encouraged.
- (E) Clustering: Clustering of residential development may be required by the Technical Review Committee in accordance with Section 30-4-6.1(B) (Single Family Detached Cluster Development).

30-7-3.3 Spill Risk Reduction

- (A) Prohibited Uses: The following uses shall be prohibited in a WCA district:

Description	SIC Industry Group Major Group Numbers
(1) Agricultural Uses	
Animal Feeder/Breeder	0210
Chemical Treatment and Fertilizer Application for Crops, Weed Control for Crop Operations, including Aerial Crop Dusting	0710,0721
(2) Business, Professional and Personal Services	
Automobile Rental or Leasing	7510
Automobile Repair Services, Major	0000
Automobile Repair Services, Minor	0000
Automobile Towing and Storage Services	7549
Boat Repairs	3730
Car Washes	7542
Commercial Chemical and Biological Research	8731
Equipment Repair, Heavy	7690
Agricultural Equipment Repair	
Boiler Cleaning and Repair	
Cesspool Cleaning	
Engine Repair, except automotive	
Farm Machinery Repair	
Industrial Truck Repair	
Machinery Cleaning	
Motorcycle Repair Service	
Rebabbiting	
Repair of Service Station Equipment	
Sewer Cleaning and Rodding	
Tank and Boiler Cleaning Service	
Tank Truck Cleaning Service	
Tractor Repair	
Welding Repair Shops	
Furniture Stripping or Refinishing	

(including secondary or accessory operations)	7641
Heavy Construction Equipment Rental and Leasing	7350
Laundromats, Coin-Operated	7215
Laundry or Dry Cleaning Plants	7211,7216,7217,7218
Lawn Care, Lawn Fertilizing Services, Lawn Spraying Services, Ornamental Shrub & Tree Services with Spraying	0780
Pest or Termite Control Services	7342
Septic Tank Services	7699
Truck Driving Schools	8249
Truck & Utility Trailer Rental & Leasing, Light	0000
Truck Tractor & Semi Rental & Leasing, Heavy	0000
Truck Washing	7542
(3) Retail Trade	
Convenience Stores with fuel pumps	5411
Fuel Oil Sales	5980
Motor Vehicle Sales (new and used)	5511
Motorcycle Sales	5571
Recreational Vehicle Sales	5561
Service Stations, Gasoline	5541
Truck Stops	5541
(4) Wholesale Trade	
Agricultural Chemicals, Pesticides, Fertilizers	5191
Chemical and Allied Products	5169
Motor Vehicles	5012
Nursery Stock, Plants Potted	5193
Paints & Varnishes	5198
Petroleum & Petroleum Products	5170
Scrap and Waste Materials	5093
(5) Transportation, Warehousing, and Utilities	
Air Transportation Facilities	4500
Bus Terminal and Service Facilities	4100,4170
Hazardous & Radioactive Waste (transportation, storage, and disposal)	4953
Inert Debris Landfills, Major	0000
Petroleum Contaminated Soil Remediation Disposal Sites	0000
Pipelines, except Natural Gas	4600
Railroad Terminals or Yards	4010
Recycling Processing Centers	0000
Refuse & Raw Materials Hauling	4212
Sanitary Sewer & Water Treatment Plant Sludge Application Sites	0000
Sewage Treatment Plants	4952
Solid Waste Disposal (nonhazardous)	4953

Trucking or Freight Terminals	4230,4213
(6) Manufacturing and Industrial Uses	0000
Animal Slaughter or Rendering	3480
Arms and Weapons	3290
Asbestos, Abrasive, and Related Products	2951
Asphalt Plants	3690
Batteries	2800
Chemicals, Paints, & Allied Products	3240,3270
Concrete, Cut Stone, & Clay Products	3241
Cement, Hydraulic	1600
Contractors, Heavy Construction	1700
Contractors, Special Trade	2020
Dairy Products	2077
Fats and Oils, Animal	2070
Fats and Oils, Plant	2091
Fish, Canned, Cured or Frozen	3110
Leather and Leather Products (tanning)	3695
Magnetic Optical Recording Media	2010
Meat & Poultry, Packing & Processing (no rendering).....	3470
Metal Coating and Engraving	1000
Mining and Quarrying	2670
Paper Products (no coating or laminating)	2670
Paper Products (coating or laminating)	2900
Petroleum and Related Products	3300
Primary Metal Products & Foundries	2610
Pulp and Paper Mills	3000
Rubber & Plastics, Misc.	3000
Rubber & Plastics, Raw	5015
Salvage Yards, Auto Parts	5093
Salvage Yards, Scrap Processing	7389
Solvent Recovery	2843
Surface Active Agents	2200
Textile Products (no dying & finishing)	2260
Textile Products (with dying & finishing)	

(B) Containment Structures:

- (1) Storage tanks for fuels and chemicals and associated pumping and piping shall be provided a spill containment system.
- (2) Such containment systems shall be of sufficient volume to contain one hundred percent (100%) of all the tank(s) contents stored in the area and shall have a leak detection system installed.

- (3) The containment system shall be approved by the Enforcement Officer and the Fire Marshall.
- (4) Such tanks and containment structures shall not be placed closer than one thousand (1,000) feet to the normal pool elevation of the existing or proposed reservoir.
- (C) Underground Storage Tanks: Underground storage tanks for fuels and chemicals shall not be permitted except as approved by the Planning Board following a finding that overall water quality protection will be enhanced as a result.
- (D) Point Source Discharges:
 - (1) No expansion of any existing private wastewater facilities or establishment of any new public or private wastewater treatment plants of any kind shall be permitted. On-site individual residential septic systems approved by the Guilford County Health Department are permitted.
 - (2) Industrial pre-treatment facilities which prepare wastewater for discharge into a public sewer system shall be permitted in WCA districts.

30-7-3.4

Stormwater Quality Runoff Control in WCA

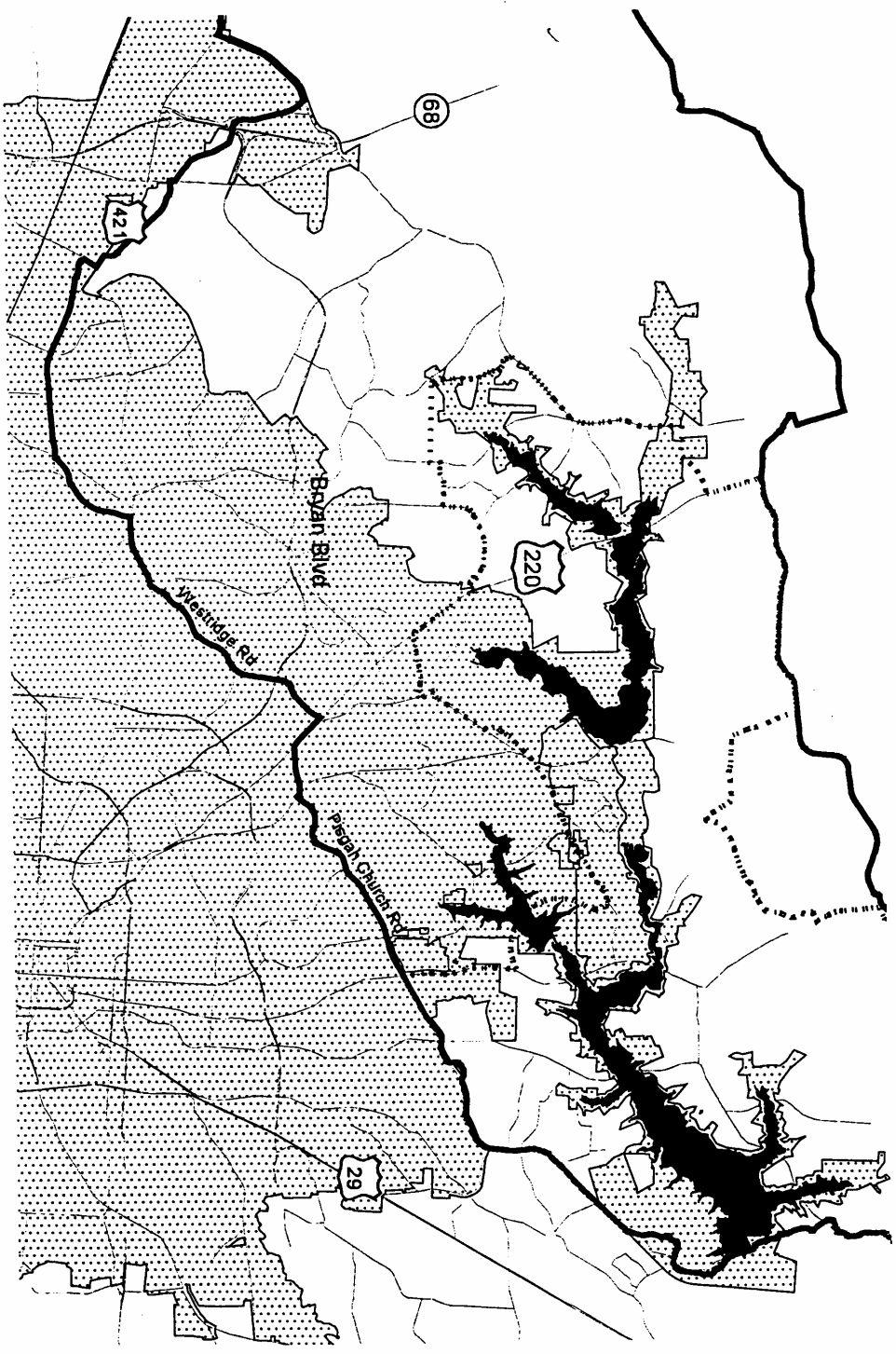
- (A) Low Density Option: Stormwater runoff from built-upon area shall be controlled as follows:
 - (1) If the built-upon area is six percent (6%) or less in the Lower Randleman Lake WCA or is twelve percent (12%) or less in any other WCA, a permanent infiltration area meeting the guidelines in the Watershed Manual may be used or an engineered stormwater control wet detention pond or other BMP meeting the performance standards in Section 30-7-1.12(B)(1) may be used.
 - (2) If the built-upon area exceeds twelve percent (12%), a wet detention pond or other BMP meeting the performance standards in Section 30-7-1.12(B)(1) shall be used.

- (B) High Density Option: See Section 30-7-1.12(B)(1).

Section 9. All ordinances in conflict with the provisions of this ordinance are repealed to the extent of such conflict.

Section 10. This ordinance will become effective January 1, 2000.

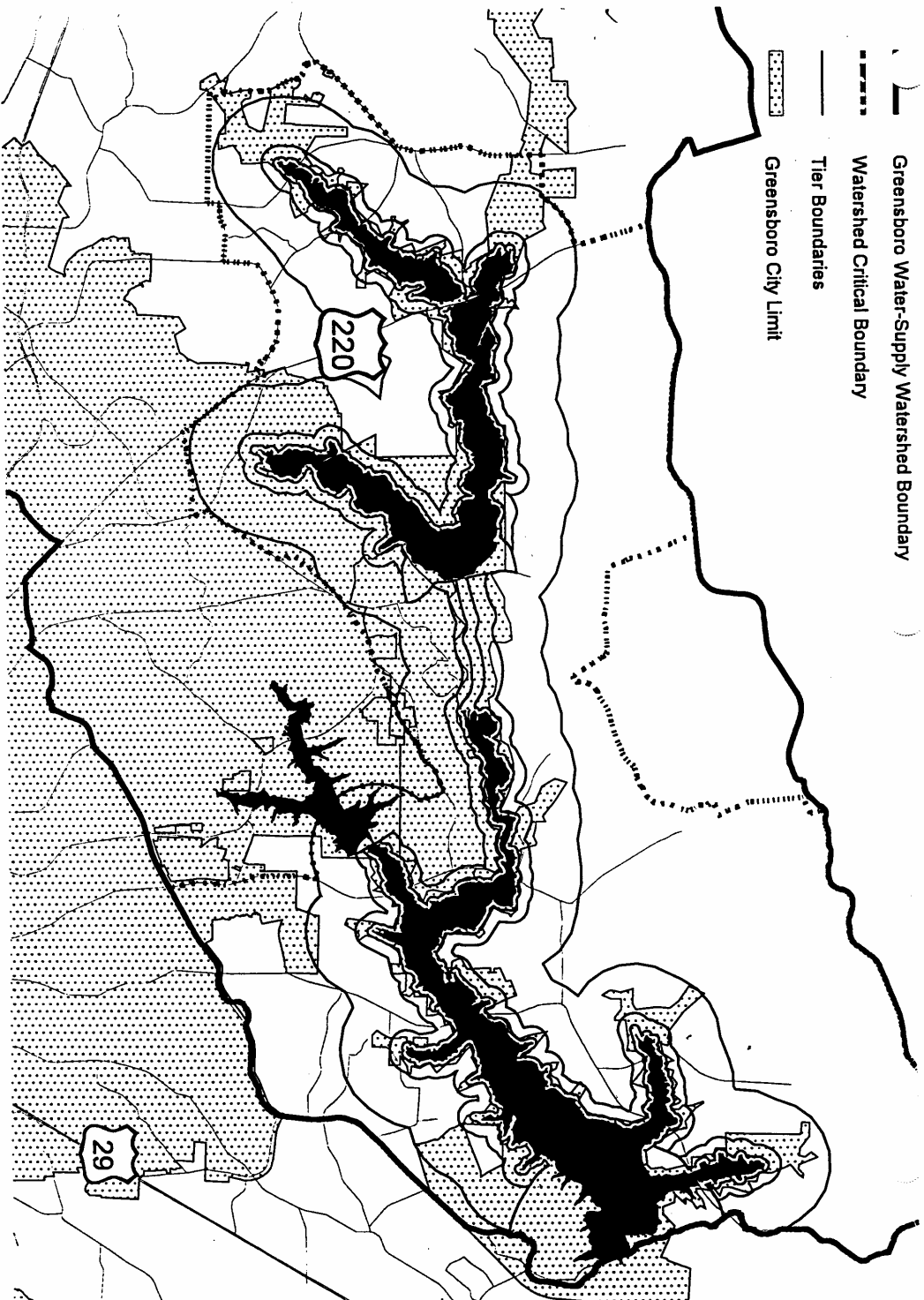
The foregoing ordinance was adopted by the City Council of the City of Greensboro on the 21 day of December, 1999, and will become effective Jan 1, 2000. This is the 32nd day of December, 1999.
 Juanita L. Cooper
 City Clerk



Greensboro Water-Supply Watershed

within City of Greensboro corporate limits

- Greensboro Water-Supply Watershed Boundary
- Greensboro City Limit
- Watershed Critical Boundary



**Greensboro Watershed Critical Area
and Tier Boundaries**

